

cyclone moved apparently northeastward, the wind decreased, changing to southwest then west. Though this storm as observed was well out of the Tropics, there seems little doubt but that it was of tropical origin and therefore a true typhoon. No further report has yet been received of it, and no mention of it is made by Father Doucette.

On August 30, near 16° N. 163° E., a ship encountered a southwest gale of force 11 at 2 p. m., with a barometer of 988.2 millibars (29.18 inches). Another vessel, on September 1, had a southerly gale of force 11, with slightly lower barometer, near 17° N. 157° E. These observations appear to refer to the same typhoon. This tropical storm, like that of the 24th-25th, is not covered in the Manila report, and therefore the probability is that not four, but at least six typhoons must be counted in the record of the August typhoons in the Far East.

Tropical cyclone of the southeastern Pacific.—One highly interesting cyclone which attained to at least near hurricane intensity occurred between Mexico and the Hawaiian Islands. In the record of tropical cyclones of the southeastern North Pacific, covering the 32-year period 1910-41, it stands unique as the only one known to have gone northwestward into the region of the great high pressure area to the northeastward of the Hawaiian Islands. Almost as remarkable, too, is the fact that its course can be traced with good approximation from its probable beginning on the 16th with center near 12°-15° N., 107° W., to its final appearance as a mere depression on the 24th near 32° N. 150° W.

The vessel earliest observing the storm reported an east gale of force 9 and depressed barometer in 15° N., 107° W., on the afternoon of the 16th. On the 18th, near 19° N., 117° W., an observation gave an east-northeast gale of force 8, barometer 1,000.5 millibars (29.54 inches). On the 19th, near 19° N. 124° W., a force 9 gale was experienced early in the morning, with only slightly depressed barometer, and therefore well north of the storm center. On the 20th a west-bound steamer ran into northeasterly winds of force 10 near 21½° N. 135° W. at 4 p. m. A little to the westward, at 4 a. m. of the 21st, the wind had risen to northeast, force 11, barometer 29.44 inches, with high seas and continuous heavy rain. About noon, near 21½° N., 137° W., the wind changed to southeasterly, force 10, then rose to force 11, continuing until 8 p. m. or later, lowest barometer 993.6 millibars (29.34 inches), near 22½° N., 138° W. Strong to heavy southeasterly gales continued thereafter on the same ship until about noon of the 22d, in 24°38' N. 139°57' W. During the 23d the storm center gradually filled in, but until about 7 a. m. gales as high in force as 9 were experienced (in 29°25' N. 144°30' W.), while a local gale of force 8 was reported as late as 6 p. m. of the 23d, in 30° N. 145°24' W.

Fog.—For the open Pacific, except for a few occurrences in the Gulf of Alaska and along the central Aleutians, reported fog was confined to a strip between about 39° and 45° N., 145° W. to 170° E. In the western part of the strip fog was general from the 17th to 19th; in the eastern part, from the 18th to 23d. Along the American coast, Swiftsure Bank lightship reported fog on 18 days. Off Oregon 4 days with fog were reported; off California, 13 days; and off Lower California, 7 days.

NOTE.—According to a late report, a tropical hurricane occurred on July 25-26, 1941, about midway between Mexico and the Hawaiian Islands. An east-bound ship entered the storm's influence near 19° N. 133° W., with falling barometer and northeast wind of force 7, on the afternoon of the 25th. About midnight she was in a full north hurricane, lowest barometer 974.6 millibars (28.78 inches), near 19° N. 132° W. At 12:20 a. m. of the 25th the wind fell to force 3 and then shifted to northwest, force 10. The wind continued of gale force until about 9 p. m. of the 26th.

TYPHOONS AND DEPRESSIONS OVER THE FAR EAST

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[Weather Bureau, Manila, P. I.]

Depression, July 26-August 2, 1941.—A weak low-pressure area moved northwest from the ocean regions about 500 miles south-southeast of Guam to a position 200 miles north of Yap. It changed its course to the west, July 29, and seemed to have the intensity of a depression. A shift to the northwest took place July 31 when about 450 miles east of San Bernardino Strait. This brought the disturbance to the ocean regions east of Balintang Channel, where it disappeared August 3. There were no indications from available reports that this depression acquired any intensity during these days.

Typhoon, August 1-14, 1941.—There appeared to be a low-pressure area south of Guam on July 30 and 31, but there was no real pressure fall until August 1, when both Guam and Yap observations gave indications of the existence of a typhoon. This storm most likely formed over the eastern Caroline Islands, but from Guam and Yap observations it seemed to have come into existence about 300 or 400 miles southsoutheast of Guam. It moved north or north-northwest and passed close to and east of Guam during the afternoon hours of August 3. It then changed to the northwest, and moved quite rapidly along this course to the Nansei Islands and the Eastern Sea, where it inclined north. It crossed Korea, after a change to the east, and finally disappeared north of Japan, August 14 and 15, as far as available observations indicate.

On August 1 and 2, when the storm first manifested its existence to our stations, a consideration of pressure values from Guam and Yap would indicate that the storm center was directly south of Guam. Yet the steady, persistent northeast winds reported from the Commercial Pacific cable office, through the kindness of Mr. P. O'Connor, make one think that the storm was moving northwesterly toward the island. At any rate, it was not so

destructive as the typhoon during November 1940, and as far as can be determined at the present writing, the storm center did not cross any part of the island. Of the many extra observations made by Mr. O'Connor, that at 3:30 p. m. (Manila time), August 3, showed the minimum pressure to be 731.3 mm. (975.0 mb.) the winds being from the west-northwest, force 9.

On August 6, the center was approaching the Nansei Islands, and on the next day, it passed close to and north of Naha. The lowest pressure value reported from this station was 712.5 mm. (950.0 mb.) (28.05 inches) (morning report, August 7) with west-southwest winds, force 1.

Over the Eastern Sea, the center threatened the locality of Shanghai, but the inclination to the north saved the city. No reports of damage due to this storm were printed in the newspapers, and it seems that it had lost its power when the center approached Korea.

The upper winds over Guam, July 31 until August 2 were from the east quadrant, velocities 20 to 30 k. p. h. and increasing, August 2, as well as backing from east to northeast. Weather conditions prevented any ascents on August 3. Over the Philippines, Zamboanga and Cebu were always under the influence of a southwesterly current, with values 50 and 60 k. p. h. at various levels, consistently after August 3. Over the northern part of the Archipelago, however, an air stream from the east and the northeast flooded the regions north of Manila until August 7, when the southwesterly current replaced it. The few reports received from Indo-China and Thailand indicate that the southwest quadrant winds over those regions were weakening (comparing velocities with those reported during July). It seems to the writer that the east quadrant current flowing into the typhoon center was the more active element. Comparing velocities reported from Philippine stations with those reported from the regions west of the China Sea, it seems that the air was being drawn toward the typhoon center, rather than being forced in that direction from regions southwest of the China Sea. These opinions may be changed when more data, especially pilots from Netherland East Indies and the Straits Settlements, are available.

Another point of interest is the easterly current, which reached Aparri, Dagupan, and Manila, August 1 to 7, inclusive. On some days, velocities as high as 50 k. p. h. were reported, various levels, and it is an indication of the intensity and power of the storm, for this easterly current checked the southwesterly current, flowing over the southern part of the Archipelago, and may be the reason why rainy and squally weather conditions did not prevail over the Philippines as the typhoon center approached the Nansei Islands, August 4 to 7.

No loss of life nor extensive property damage during the whole course of the typhoon came to the notice of the writer.

Typhoon, August 6-18, 1941.—Similar to the preceding storm, this typhoon may have formed over the Eastern

Caroline Islands, for it first appeared as a well developed typhoon about 300 miles southeast of Guam, August 7. It seems to have changed from a westerly to a northerly course on August 8, and passed about 100 miles east of the island during the afternoon hours of that day. It then began a long and rather rapid course toward the Nansei Islands, but its motion was checked, August 13 and 14, about 300 miles east-southeast of Naha and its further motion was to the north. It crossed southern Japan, inclined to the north-northeast and disappeared far to the northeast of Japan, August 18.

The pilots reported from Guam, August 6 to 8, showed the presence of a weak current from the east-southeast (velocities 3 to 26 k. p. h. various levels) August 6, which changed to the north quadrant and increased in velocity, values up to 52 k. p. h. being reported. On August 8, the directions were from the north-northwest and north, with velocities weakening, 30 to 40 k. p. h. being the values given. These were short ascents, weather conditions being unfavorable for longer observations.

The lowest pressure value reported by Mr. P. O'Connor, at the Commercial Pacific Cable Co. office, was 748.8 mm. (998.4 mb.) with west winds force 3, at 4 p. m. (Manila time), August 8. Later on, when the typhoon center was close to Borodino Island, the lowest value sent from that station was 735.8 mm. (981.0 mb.) with north-northeast winds, force 8, at 6 a. m., August 14.

Typhoon, August 10-14, 1941, approximately.—Some time during these days, a typhoon center came close to Wake Island and inflicted considerable property damage, but without loss of life. It is supposed that the center was moving northward at the time. No ships' observations were received from adjacent regions during these days, and only the fact of the storm's existence over these regions can be given.

Typhoon, August 15-24, 1941.—From August 14 to 17, all that was known about the weather conditions east of the Philippines was that a trough of low pressure extended east of Balintang Channel. It is assumed that a depression formed over the northern part of the Mariana Islands and moved west or west-northwest to the regions about 400 miles east-northeast of Basco, Batanes Prov. Then, on August 18, a weather observation from a ship (name unknown) showed that there was a small but active center located about 350 miles east-northeast of Basco. This typhoon then moved almost directly northward, passing close to and west of Naha. It crossed the Eastern Sea and moved over Korea into Manchuria, where it disappeared August 25.

The lowest barometer reading from Naha was 729.0 mm. (971.9 mb.) with winds from the southeast, force 7, reported the morning of August 21.

From August 15 to about the 25th, the Manila newspapers had frequent reports of damage due to rains in the provinces. There were landslides or washouts along roads, and in a few cases one or two lives were lost.

These reports were from many places, none of them indicating anything very serious, but altogether there must have been considerable property damage due to the rains and floods, together with the estimated loss of about 10 lives. All this happened at the time when this depression, later typhoon, was in existence over the ocean far from the Philippines.

Depression, August 27-31, 1941.—A mild depression appeared between Yap and Guam, August 27, and moved west-northwest, then northwest to the regions east of San Bernardino Strait. At the present writing it seems to have been of minor importance.

RIVER STAGES AND FLOODS

By BENNETT SWENSON

During the month of August 1941, most of the States east of the Mississippi River had below normal precipitation, but west of the Mississippi and in the Upper Great Lakes Region all except six States had above normal precipitation. The driest States in the West were Iowa and Nebraska, with approximately 50 percent of normal; and in the East, Virginia, with 66 percent of normal for the month.

River stages which had risen rather generally in the southeastern portion of the country during July receded in August to low levels in most cases. The only notable rise during August was in the Black Warrior and Tombigbee Rivers, where flood stage was reached at two stations early in the month. In the Tennessee River the stages declined gradually during the month to below normal and streams in the Northeast continued to recede to critically low levels.

Unprecedented floods occurred in northern Wisconsin as the result of unusually heavy rains beginning August 29 with amounts of 10 to 15 inches in 60 hours. The floods were most severe in the headwaters of the Chippewa, St. Croix, and Wisconsin River Basins, the highest stages of record being reached at several points. These floods continued into the next month and a complete report will be made in a later issue of the REVIEW.

Moderate overflows occurred in Kansas, mainly in the Osage, Cottonwood, Neosho, and Smoky Hill River Basins, near the end of August. Damage due to the overflow was light, amounting to about \$8,000 in the Osage and \$15,000 in the Neosho Basin. Slight flooding also occurred in the Canadian Rivers in Oklahoma but no damage was reported.

FLOOD-STAGE REPORT FOR AUGUST 1941

River and station	Flood stage	Above flood stages—dates		Crest	
		From—	To—	Stage	Date
ATLANTIC SLOPE DRAINAGE					
Santee:	<i>Feet</i>			<i>Feet</i>	
Rimini, S. C.	12	{ (1) 8	2	9 12.4	9
Ferguson, S. C.	12		(1)		
EAST GULF OF MEXICO DRAINAGE					
Black Warrior: Lock No. 7, Eutaw, Ala.	35	4	5	36.0	5
Tombigbee: Lock No. 3, Whitfield, Ala.	33	5	7	34.3	6
MISSISSIPPI SYSTEM					
<i>Upper Mississippi Basin</i>					
Wisconsin: Knowlton, Wis.	12	31	(3)		
<i>Missouri Basin</i>					
Smoky Hill: Lindsborg, Kans.	21	25	25	21.1	25
Republican: Guide Rock, Nebr.	9	24	24	9.5	24
Osage:					
Quenemo, Kans.	30	27	28	33.6	27
Ottawa, Kans.	24	28	28	24.0	28
<i>Arkansas Basin</i>					
Cottonwood: Emporia, Kans.	20	26	27	21.2	26
Neosho:					
Neosho Rapids, Kans.	22	26	27	24.7	27
Le Roy, Kans.	23	27	29	24.8	27
Iola, Kans.	15	27	29	17.4	27
Oswego, Kans.	17	31	31	17.0	31
North Canadian: Yukon, Okla.	8	(1)	(3)	9.7	26
				10.4	29
<i>Lower Mississippi Basin</i>					
Coldwater: Coldwater, Miss.	13	28	30	13.5	29

¹ Continued from preceding month.

² Stages affected by backwater from dam (Santee-Cooper Project).

³ Continued into following month.